



# International Space Station ISS/Shuttle Joint Operations Book

## ISS-4A

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**Mission Operations Directorate  
Operations Division**

**Preliminary  
March 11, 1998**

*These procedures are available  
electronically on the SODF Homepage  
at <http://ftpproc.jsc.nasa.gov>*

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas



**INTERNATIONAL SPACE STATION  
ISS/SHUTTLE JOINT OPERATIONS BOOK  
ISS-4A**

PRELIMINARY  
March 11, 1998

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*Deferred until Final*  
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This document is not currently under the configuration control of the Systems Operations Data File Control Board (SODFCB). During the interim, changes may be submitted to the book manager.

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\*Controlled out of EMERGENCY Book 4A Prelim

## ARRIVAL PROCEDURES

PMA 3 HEATER ACTIVATION FOR DOCKING .....	TBD
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ISS CONFIGURE FOR DOCKING .....	TBD
DOCKING MECHANISM INITIALIZATION .....	TBD
DOCKING MECHANISM POWERUP .....	TBD
DOCKING RING RETRACTION (NOT MATED) .....	TBD
DOCKING RING EXTENSION .....	TBD
DOCKING MECHANISM DEMATE/RE Mate .....	TBD
APDS FAILED CAPTURE RECONFIGURATION .....	TBD
CONNECTOR SWITCH BOX CONFIGURE TO ODS .....	TBD
CONNECTOR SWITCH BOX CONFIGURE TO PMA 3 .....	TBD
PMA 3 HOOKS CLOSE .....	TBD
ODS HOOKS OPEN - CONTINGENCY .....	TBD
DOCKING MECHANISM POWERDOWN .....	TBD

ARRIVAL

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## ACS ARRIVAL MODING

### 1. VERIFY ACS MODING PRE-ARRIVAL CONFIGURATION AND STATUS

#### NOTE

Arrival Mode initialization should be performed one hour before entering the orbiter prox-ops phase.

PCS

MCS: ACS Moding

ACS Moding

'ACS Configuration'

√Moding Role Primary, Secondary NCS - Full

√RS Mode Primary, Secondary NCS - Cntl

'Arrival'

√PMA3 Arrival Response SW Primary, Secondary NCS - Inh

### 2. ENABLE APAS LED LIGHTING

#### NOTE

Each of the primary and secondary commands turns on two of the four LED ACS indication lights (i.e., 4 total).  
LED configuration: On - Station Active Attitude Control,  
Off - LED Software Off, Flash - Station in Free Drift.

'ACS Configuration'

sel LED Control SW

'Primary NCS'

**cmd** Enable

√LED Control SW - Ena

√PMA3 LED State - On

'Secondary NCS'

**cmd** Enable

√LED Control SW - Ena

√PMA3 LED State - On

Visual verification by orbiter crew that LED indicators are On (-Z window).



NOTE  
If orbiter crew determines LEDs are not on, verify with  
**MCC-H/MCC-M** that ISS is in active attitude control.

3. ENABLE ARRIVAL SOFTWARE SWITCH MONITORING FOR ACS  
MODING

ACS Moding  
'Arrival'

sel PMA3 Arrival Response SW  
'Primary NCS'

**cmd** Enable  
√Arrival SW - Ena

'Secondary NCS'

**cmd** Enable  
√Arrival SW - Ena

```
*****
* If Primary/Secondary NCS Arrival Response SW needs to be inhibited *
* (wave off, etc.), then the following commands should be sent:      *
*                                                                       *
*   sel PMA3 Arrival Response SW                                       *
*   'Primary, Secondary NCS'                                           *
*                                                                       *
*   cmd Inhibit                                                         *
*   √PMA3 Arrival Response SW - Inh                                    *
*****
```

4. ATTITUDE CONTROL SYSTEM ARRIVAL MONITORING AND MODING

Verify **MCC-H/MCC-M** Go for Orbiter Arrival/Docking.

Monitor the following signals during the docking phase.

'Arrival'

√PMA3 Capture Long Primary, Secondary NCS - X

√Arrival Event Primary NCS - X

√Arrival Event Secondary NCS - X

'ACS Configuration'

√RS Mode Primary, Secondary NCS - Drift

√PMA3 LED State Primary, Secondary NCS - Flash

Visual verification by orbiter crew that LED indicators are flashing (-Z window).

NOTE

If orbiter crew determines LEDs are not flashing, verify with **MCC-H/MCC-M** that ISS is in Free Drift.

'Departure'

√PMA3 Interface Sealed Primary, Secondary NCS - X

√PMA3 Undocking Complete Primary, Secondary NCS - Blank

## ACS POST ARRIVAL MODING

- PCS
1. ACS POST ARRIVAL LED INDICATOR MODING  
MCS: ACS Moding  

ACS Moding

  
'ACS Configuration'  
  
sel LED Control SW  
'Primary NCS'  
  
**cmd** Inhibit  
√LED Control SW - Inh  
√PMA3 LED State - Off  
  
'Secondary NCS'  
  
**cmd** Inhibit  
√LED Control SW - Inh  
√PMA3 LED State - Off  
  
Visual verification by orbiter crew that LED indicators are Off (-Z window).
  2. DISABLE ARRIVAL RESPONSE SOFTWARE  
'Arrival'  
  
sel PMA3 Arrival Response SW  
'Primary NCS'  
  
**cmd** Inhibit Arm  
√Arm Status - Arm  
**cmd** Inhibit  
√Arrival SW - Inh  
√Arm Status - Disarm  
  
'Secondary NCS'  
  
**cmd** Inhibit Arm  
√Arm Status - Arm  
**cmd** Inhibit  
√Arrival SW - Inh  
√Arm Status - Disarm

## DEPARTURE PROCEDURES

ISS SYSTEM POWERUP POST ARRIVAL .....	TBD
ISS CONFIGURE FOR UNDOCKING .....	TBD
ACS PRE-DEPARTURE MODING CONFIGURATION.....	2-3
ACS DEPARTURE MODING.....	2-5
ACS POST DEPARTURE MODING CONFIGURATION.....	2-7
UNDOCKING PREPARATION.....	TBD
FEATHER P6 SOLAR ARRAYS FOR DEPARTURE.....	2-8
ISS SYSTEM RECONFIGURATION DOWN FOR DEPARTURE.....	TBD
PMA 3 HOOKS OPEN.....	TBD
PMA 3 HOOKS OPEN - CONTINGENCY.....	TBD
ISS SYSTEM POWERUP POST-DEPARTURE .....	TBD

DEPARTURE

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## ACS PRE-DEPARTURE MODING CONFIGURATION

### NOTE

The Pending Back Off timer should be configured a minimum of one hour before undocking. Program default is 10 seconds.

PCS

#### 1. VERIFY ACS MODING ROLE CONFIGURATION

MCS: ACS Moding

ACS Moding

'ACS Configuration'

√Moding Role Primary, Secondary NCS - Full

#### 2. VERIFY RUSSIAN SEGMENT MODE STATUS

'ACS Configuration'

√RS Mode Primary, Secondary NCS - Drift

#### 3. VERIFY INITIAL ACS HW SIGNAL CONFIGURATION

sel ACS Moding HW Signals

ACS Moding HW Signals

'Departure'

√PMA3 Interface Sealed N1-1, N1-2 NCS - X

√PMA3 Undocking Complete N1-1, N1-2 NCS - Blank

#### 4. VERIFY NCS SOFTWARE DEPARTURE EVENT STATUS AND CONFIGURATION

sel ACS Moding

ACS Moding

'Departure'

√PMA3 Interface Sealed Primary, Secondary NCS - X

√PMA3 Undocking Complete Primary, Secondary NCS - Blank

√Departure Event Primary, Secondary NCS - Blank

#### 5. SET PENDING BACK OFF TIMER FOR ORBITER DEPARTURE

ACS Moding

'Departure'

sel Pending Back Off Time

'Primary NCS'

**cmd** 10 Seconds

√Pending Back Off Time - 10

√Arm Status - Arm

'Secondary NCS'

**cmd** 10 Seconds

√Pending Back Off Time - 10

√Arm Status - Arm

```
*****
* If the Pending Back Off Time needs to be canceled or configured *
* later, disarm the current Pending Back Off Time as follows:      *
*                                                                    *
*   sel Back Off Time                                              *
*   'Primary, Secondary NCS'                                       *
*                                                                    *
*   cmd Cancel Pending Back Off Time                               *
*   √Arm Status - Disarm                                           *
*****
```

6. INCORPORATE PENDING BACK OFF TIME

'Departure'

sel Back Off Time

'Primary NCS'

**cmd** Incorporate Pending Back Off Time

√Back Off Time - 10

√Arm Status - Disarm

'Secondary NCS'

**cmd** Incorporate Pending Back Off Time

√Back Off Time - 10

√Arm Status - Disarm

## ACS DEPARTURE MODING

### PCS 1. ENABLE DEPARTURE SWITCH MONITORING FOR ACS MODING

MCS: ACS Moding

ACS Moding

'Departure'

sel PMA3 Departure Response SW

'Primary NCS'

**cmd** Enable Arm

√Arm Status - Arm

**cmd** Enable

√Arm Status - Disarm

√Departure SW - Ena

'Secondary NCS'

**cmd** Enable Arm

√Arm Status - Arm

**cmd** Enable

√Arm Status - Disarm

√Departure SW - Ena

### 2. VERIFY DEPARTURE EVENT SOFTWARE STATUS

'Departure'

√Departure Event Primary, Secondary NCS - Blank

### 3. ENABLE APAS LED LIGHTING

#### NOTE

Each of the primary and secondary commands turns on two of the four LED ACS indication lights (i.e., 4 total). LED configurations: On - Active Attitude Control, Off - Power Off, Flash - ISS in Free Drift.

'ACS Configuration'

sel LED Control SW

'Primary NCS'

**cmd** Enable

√LED Control SW - Ena

√PMA3 LED State - Flash

sel LED Control SW

'Secondary NCS'



**cmd** Enable

√LED Control SW - Ena

√PMA3 LED State - Flash

Visual verification by orbiter crew that LED Indicators are flashing (-Z windows).

4. MONITOR NCS SEPARATION SIGNALS AND VERIFY ORBITER DEPARTURE AND POST SEPARATION LED MODE CHANGE  
Perform CONFIG C&DH FOR ORBITER UNDOCKING WHILE N1-2(1) PRIMARY, all (C&DH:), then

Verify **MCC-H/MCC-M** Go for Orbiter Departure.

NOTE

1. Monitor the change in parameter values during orbiter undocking. At orbiter separation (i.e., Undocking Complete is true and Interface Sealed is false), the Countdown Timer is initiated.
2. Monitor the Countdown Timer. The primary Departure Event is received when the Countdown Timer reaches zero. The occurrence of this event prompts the SM to retake attitude control.

ACS Moding

'Departure'

√PMA3 Interface Sealed Primary, Secondary NCS - Blank

√PMA3 Undocking Complete Primary, Secondary NCS - X

√Countdown Timer Primary, Secondary NCS - (Decreasing)

√Departure Event Primary, Secondary NCS - X (when timer = 00:00)

5. VERIFY RUSSIAN SEGMENT MODE STATUS  
'ACS Configuration'

√RS Mode Primary NCS - Cntl

√RS Mode Secondary NCS - Cntl

√PMA3 LED State Primary NCS - On

√PMA3 LED State Secondary NCS - On

Visual verification by orbiter crew that LED Indicators are On (-Z windows).

## ACS POST DEPARTURE MODING CONFIGURATION

### 1. DISABLE LED MODE INDICATION

#### NOTE

The functions in this section are to occur following the end of the orbiter Prox-Ops phase.

PCS

MCS: ACS Moding

ACS Moding

'ACS Configuration'

sel LED Control SW

'Primary NCS'

**cmd** Inhibit

√LED Control SW - Inh

√PMA3 LED State - Off

'Secondary NCS'

**cmd** Inhibit

√LED Control SW - Inh

√PMA3 LED State - Off

### 2. DISABLE DEPARTURE RESPONSE

'Departure'

sel PMA3 Departure Response SW

'Primary NCS'

**cmd** Inhibit

√Departure SW - Inh

'Secondary NCS'

**cmd** Inhibit

√Departure SW - Inh

## FEATHER P6 SOLAR ARRAYS FOR DEPARTURE

1. VERIFY THE PROXIMITY OPERATIONS POWERDOWN STATUS  
√**MCC-H** Proximity Operations powerdown has been completed.
2. VERIFY PSN IS IN NON-SOLAR TRACKING MODE  
P6: EPS: ECU\_BGA 4B(2B)  

ECU\_BGA 4B(2B)

  
'BGA 4B(2B)'  
  
√PSN Mode - Non-Solar Tracking
3. SEND PVCA ECU BGA 4B(2B) BLIND MODE DIRECTED POSITION TO PRIMARY MDM  
sel Mode  
Blind Mode Directed Position  
set Time After Loss of Comm, seconds = 270  
set Commanded Angle, degrees = 5  
**cmd** Directed Position [T]  
  
√Selected Blind Mode - Directed Position
4. SEND PVCA ECU BGA 4B(2B) BLIND MODE DIRECTED POSITION TO BACK-UP MDM  
Bkup Blind Mode Directed Position  
set Time After Loss of Comm, seconds = 270  
set Commanded Angle, degrees = 5  
**cmd** Directed Position [T]  
  
√Selected Bkup Blind Mode - Directed Position
5. SEND ECU BGA 4B(2B) CONTINGENCY CONTROL-ANGLE HOLD TO ECU BGA  
sel Angle Commands  
**cmd** Ang Hold Cont [T]  
  
√TBD
6. CONFIGURE ECU BGA 4B(2B) MODE TO SAFE LOCK  
Mode Safe Lock  
set Commanded Angle, degrees = 5  
set Latch Select = Latch 1  
**cmd** Safe Lock [T]  
  
√Mode - Safe Lock

## 7. VERIFY ECU BGA STATUS

### NOTE

Upon completion of the Safe Lock Mode executed, wait TBD minutes to verify the latched parameters.

P6: EPS: ECU\_BGA 4B(2B)

ECU\_BGA 4B(2B)

'BGA 4B(2B)'

PARAMETER	ACTUAL→	TRANSITION→	COMMANDED
√Angle, deg	90	0 --- 360	5
√Angle Rate, deg/s	4	4	0
√Mode	Rate	Safe Lock	Safe Lock
√Motor Velocity, deg/s	± 4.05	± 4.05	0
√Motor current, A	-0.3 --- 1.8 ± .3	-0.3 --- 1.8 ± .3	0
√Latch Current, A	-0.6 --- 3.6	-0.6 --- 3.6	0
√Latch 1 Position	Unlatched	Unlatched	Latched
√Latch 1 Voltage, V	15	15	0
√Latch 2 Position	Unlatched	Unlatched	Unlatched
√Latch 2 Voltage, V	15	15	0

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## OIU/APCU NOMINAL OPERATIONS

OIU ACTIVATION AND CHECKOUT.....	TBD
APCU ACTIVATION (B CONFIGURATION).....	3-3
APCU DEACTIVATION (B CONFIGURATION).....	3-4
OIU DEACTIVATION.....	TBD

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## APCU ACTIVATION (B CONFIGURATION)

### CAUTION

To prevent damage to the internal converters and the relay, the APCU output relay must not be opened or closed under load (Converter – On (tb – gray)).

CRT

SM 200 APCU Status

- R1
1. VERIFY PAYLOAD PRIMARY MAIN C ON  
√PL PRI MNC tb - On
  2. VERIFY PAYLOAD CABIN BUS ON  
√PL CAB - MNA
  3. VERIFY SWITCH POWER  
SSP2 (L12L) √SW PWR CB1 - On  
SSP1 (L12U) √SW PWR CB2 - On
  4. CLOSE APCU OUTPUT RELAY  
√APCU1(2) CONV tb - bp  
APCU1(2) OUTPUT → On
  5. TURN APCU CONVERTER ON  
APCU1(2) CONV → On  
√APCU1(2) CONV tb - gray  
√APCU1(2) OUTPUT tb - gray

CRT

SM 200 APCU Status

√APCU1(2) OUT VOLTS RES LOW  $\geq 136$



## APCU DEACTIVATION (B CONFIGURATION)

### CAUTION

To prevent damage to the internal converters and the relay, the APCU output relay must not be opened or closed under load (Converter - On (tb - gray)).

CRT

SM 200 APCU Status

- SSP1 (L12L)  
SSP2 (L12U)
1. TURN APCU CONVERTER OFF  
APCU1(2) CONV → Off  
  
√APCU1(2) CONV tb - bp  
√APCU1(2) OUTPUT tb - bp
  2. OPEN APCU OUTPUT RELAY  
APCU1(2) OUTPUT → Off

## INGRESS STATION

NODE 1/PMA 1 PRE-INGRESS HEATER RECONFIGURATION.....	TBD
PMA 3 PRE-INGRESS SHELL HEATER RECONFIGURATION.....	TBD
ODS VOLUME PREPARATION FOR INGRESS.....	TBD
ODS VOLUME PREPARATION FOR EGRESS .....	TBD
HATCH COMMON OPEN.....	TBD
HATCH-APAS CLOSE.....	TBD
HATCH-APAS OPEN.....	TBD
PMA 3 APAS PREPARATION FOR DOCKING .....	TBD
VESTIBULE OUTFITTING NODE 1 NADIR.....	4-3
CBM CENTER DISK COVER REMOVAL.....	4-10
CBM CENTER DISK COVER REPLACE.....	4-14
PMA 3 TEMPORARY CLOSEOUT .....	TBD
PMA 3 INGRESS.....	4-18
NODE 1 INGRESS .....	4-21
PMA 1 INGRESS.....	TBD
FGB INGRESS .....	4-24
ORBITER/ISS REPRESSURIZATION.....	TBD

INGRESS  
STATION

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## **VESTIBULE OUTFITTING NODE 1 NADIR**

### OBJECTIVE:

Remove CBM hardware, install utility jumpers essential to Flight 4A operations.

### LOCATION:

Installed: Node 1 Nadir Vestibule

### DURATION:

1 hour

### PARTS:

None

### MATERIALS:

None

### TOOLS REQUIRED:

Equipment Bag

Portable Work Lights

Portable Fan

Kit A:

1/2" Combination Wrench

6" Adjustable Wrench

Kit C:

7/16" Socket, 3/8" Drive

Kit E:

Ratchet 3/8" Drive

Kit G:

(30-200 in-lbs) Torque Wrench, 3/8" Drive

### REFERENCED PROCEDURE(S):

None

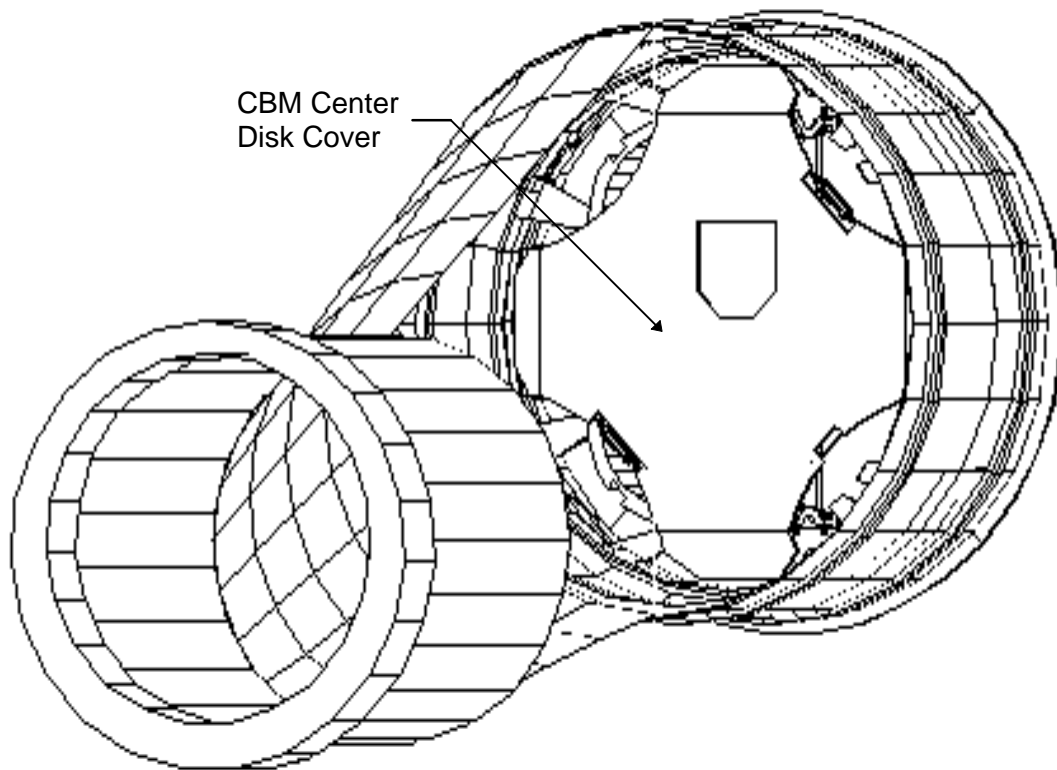


Figure 1.- PMA 3, Node1 Vestibule.

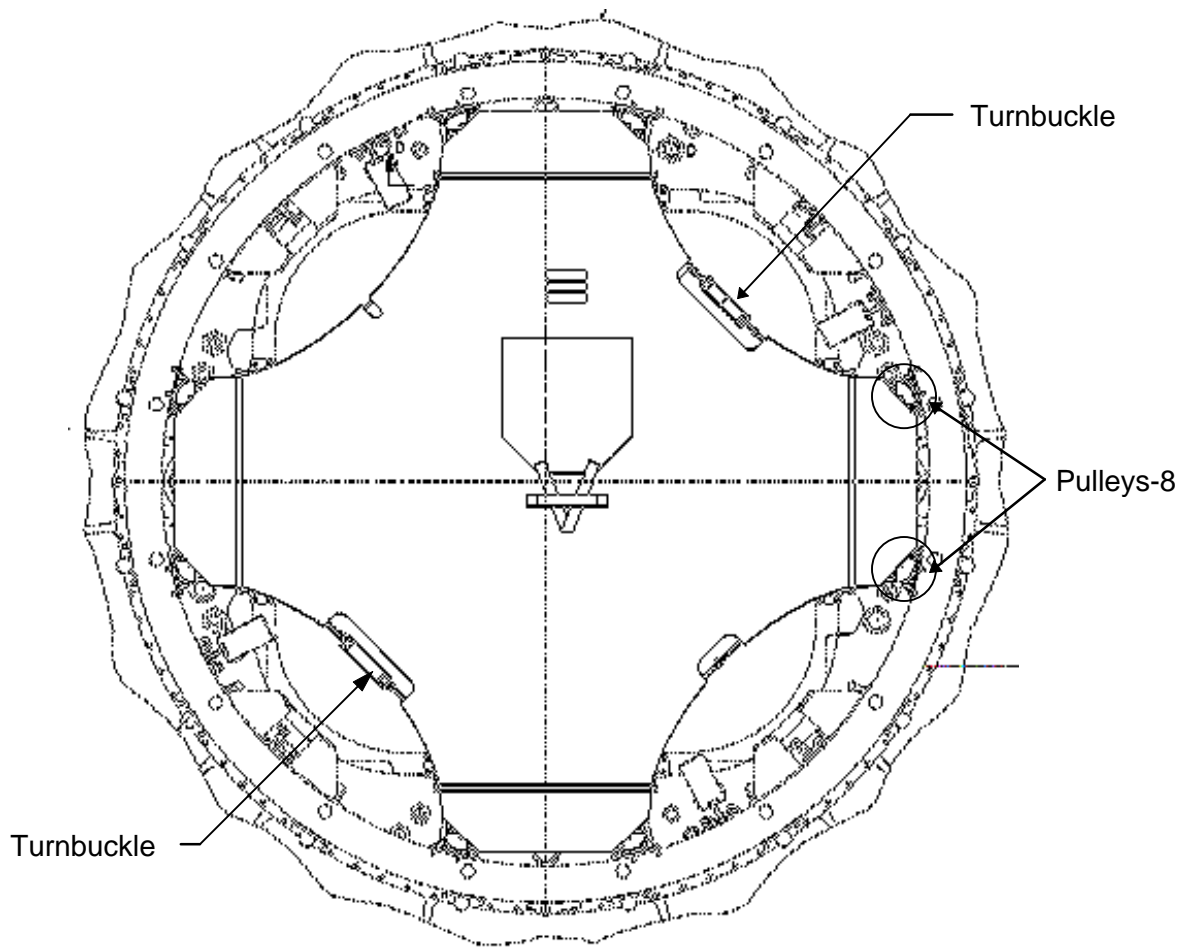


Figure 2.- CBM Center Disk Cover.

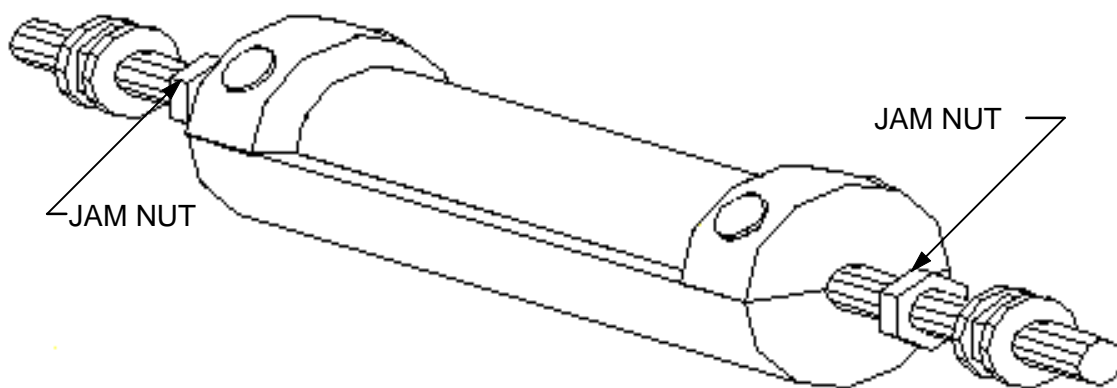


Figure 3.- Turnbuckle.

### REMOVE CBM CENTER DISK

1. Loosen Jam Nuts (two) at ends of Turnbuckles (1/2" Combination Wrench, 6" Adjustable Wrench).  
See Figures 2 and 3.
2. Unscrew Turnbuckles (two), release tension on pulleys. Approximately 72 turns produces a hard stop.

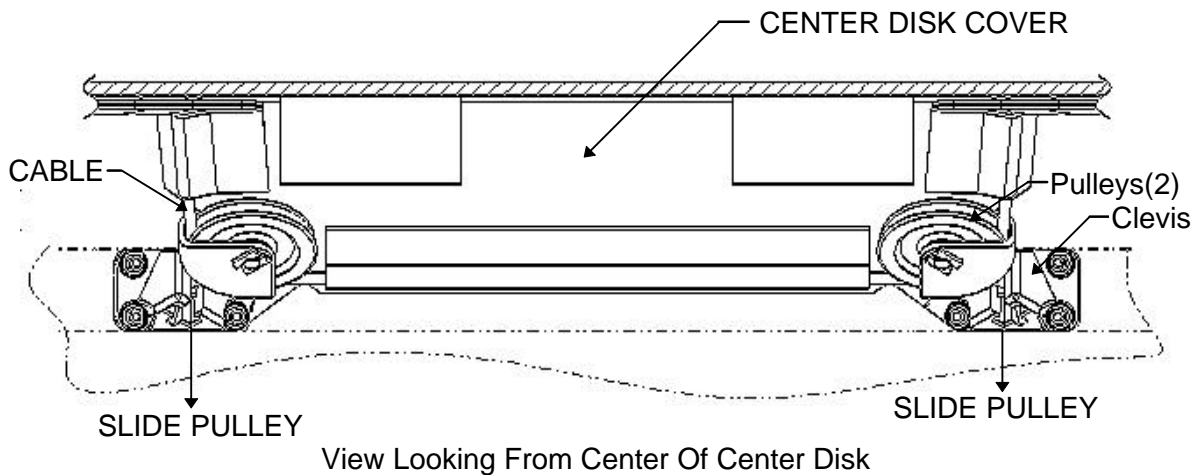
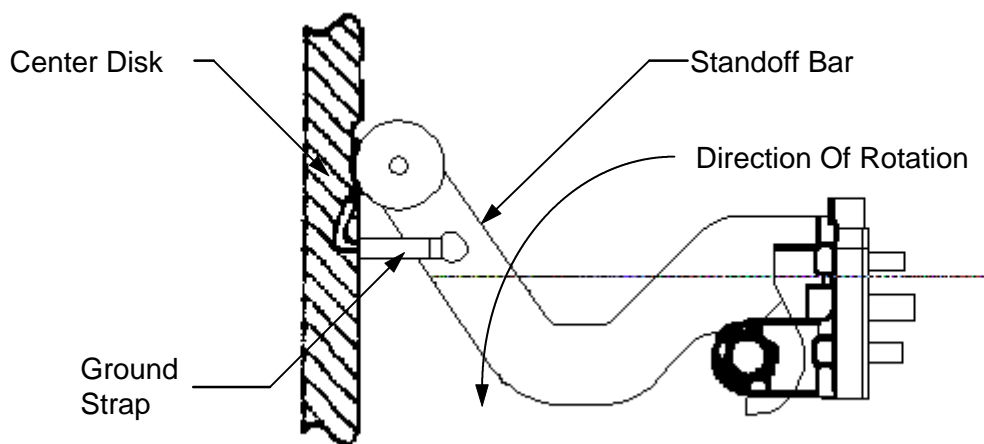


Figure 3.- Pulley, Cable, and Clevis.

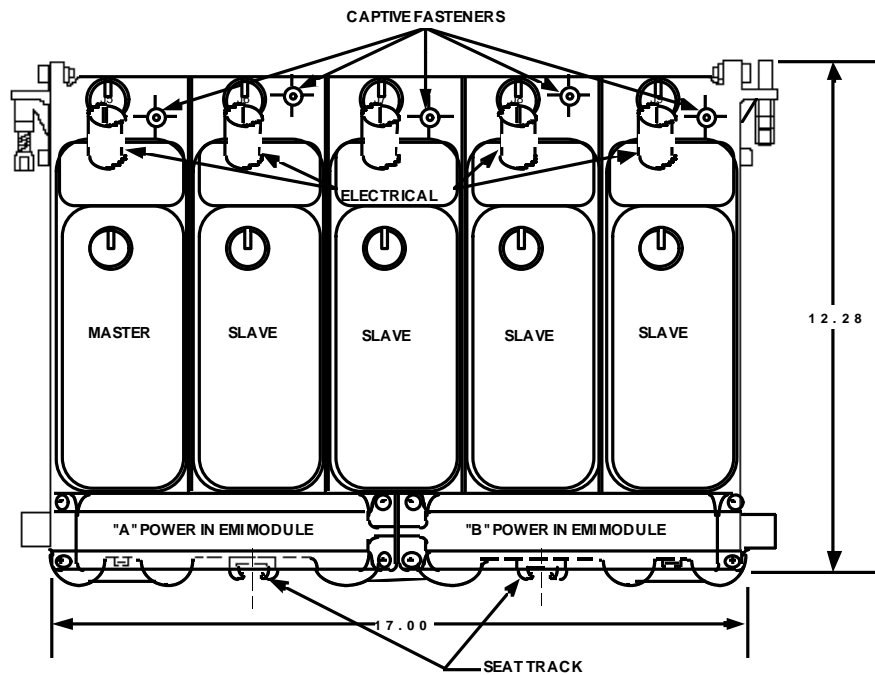
#### NOTE

Recommend removing pulleys and standoff bars by quadrants.

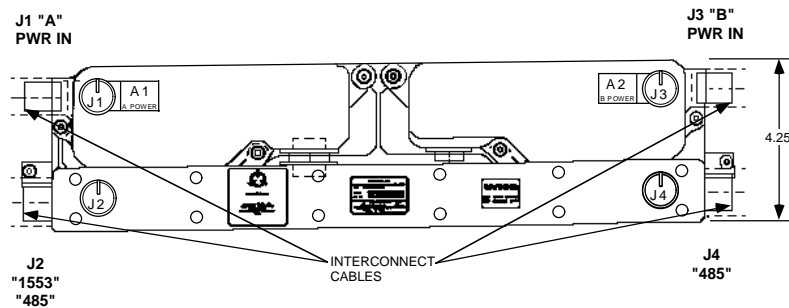
3. Remove pulley from Clevis by pushing towards ACBM ring and sliding from Clevis.  
See Figure 3.



4. Remove Ground Strap from Standoff Bar (Ratchet 3/8", TBD Socket). See Figure 4.
5. Rotate Standoff Bar towards Hatch center, remove from structure. Temporary stow. See Figure 4.
6. Repeat steps 1 through 6 for remaining quadrants (three).
7. Fold cover. Temporary stow.



Front View Controller Panel Assembly



Bottom View Controller Panel Assembly

Figure 5.- Controller Panel Assembly (CPA), Front and Bottom View.



**NOTE**

Port Controller Panel Assembly on Nadir port must be removed to install IMV flex duct.

**REMOVE PORT CONTROLLER PANEL ASSEMBLY (CPA)**

8. Verify RPCs (eight) open, inhibited (TBD).
9. Electrical connectors (nine)  $\leftarrow| \rightarrow$  CPA. Place caps on cable connectors (nine).  
See Figure 5.
10. Restrain electrical cables.
11. Place caps (nine) on the CPA connectors.
12. Remove CPA, fasteners (five) (Ratchet 1/4" Drive, 7/16" Socket).  
Temporary stow.

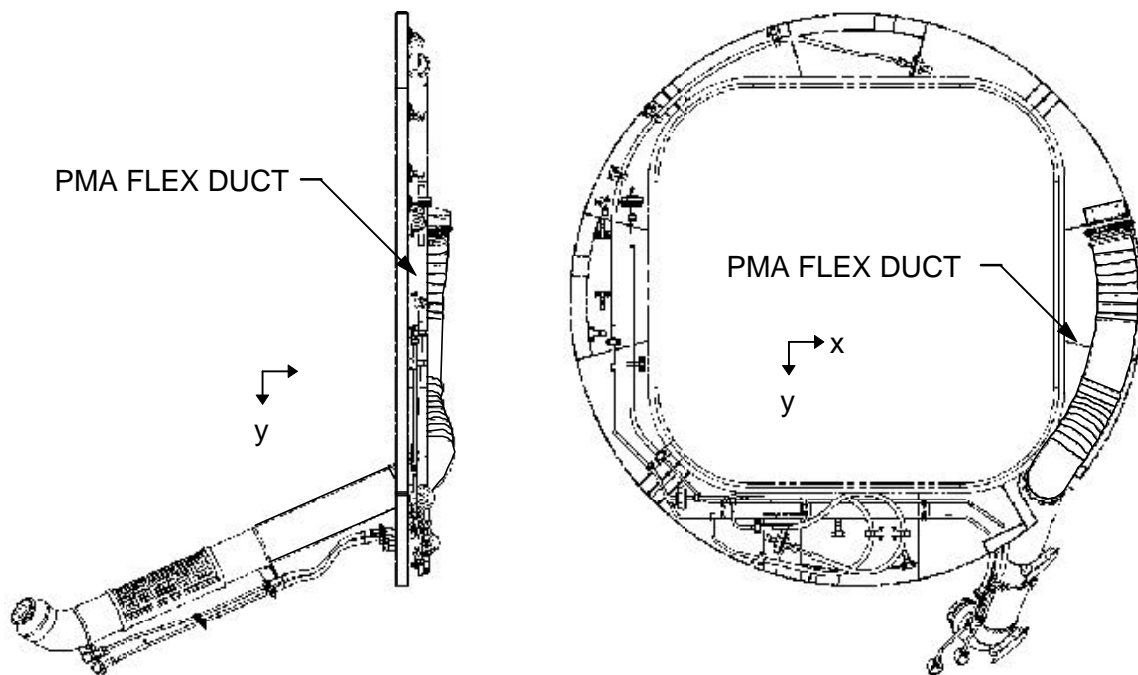


Figure 6.- PMA Bulkhead and Ducting.

#### INSTALL IMV DUCT

13. Remove IMV cap from Node 1 Nadir bulkhead feedthrough A4, V-band clamp (Ratchet 3/8" Drive, 7/16" Socket). Temporary stow cap.
14. Remove launch restraint Velcro Straps (two) from duct attached to receptacle on PMA 3 wall.  
See Figure 6.
15. Install duct to Node 1 bulkhead, fasten V-band clamp (Ratchet 3/8" Drive, 7/16" Socket).
16. Install duct to Node bulkhead using V-band clamp, tighten, torque to 155 in-lbs (Ratchet 3/8" Drive, 7/16" Socket, (30-200 in-lbs) Torque Wrench).

#### INSTALL PORT CPA

17. Tighten fasteners (five), torque to  $130 \pm 5$  in-lbs (Ratchet 3/8" Drive, 7/16" Socket, (30-200 in-lbs) Torque Wrench).

Table 1. CBM Controller Power/Data Cables

Cable	Plug No.	Receptacle No.	Harness No.
Capture Latch	P1	J5	TBD
Powered Bolt	P1	J6	TBD
Powered Bolt	P1	J7	TBD
Powered Bolt	P1	J8	TBD
Powered Bolt	P1	J9	TBD
Primary Power	P2	J1	TBD
Secondary Power	P1	J3	TBD
1553 Bus Data	P2	J2	TBD
485 Bus Data	P1	J4	TBD

18. Mate all CPA power, data cables (nine).  
See Table 1.
19. Stow tools, equipment.

## **CBM CENTER DISK COVER REMOVAL**

### OBJECTIVE:

Remove CBM Center Disk to allow crew access to attached modules and vestibule areas.

### LOCATION:

Installed: Node 1 Radial Ports

Stowed: √Maintenance Database

### DURATION:

20 minutes

### PARTS:

None

### MATERIALS:

None

### TOOLS REQUIRED:

Equipment Bag

Portable Work Lights

Kit A:

1/2" Combination Wrench

6" Adjustable Wrench

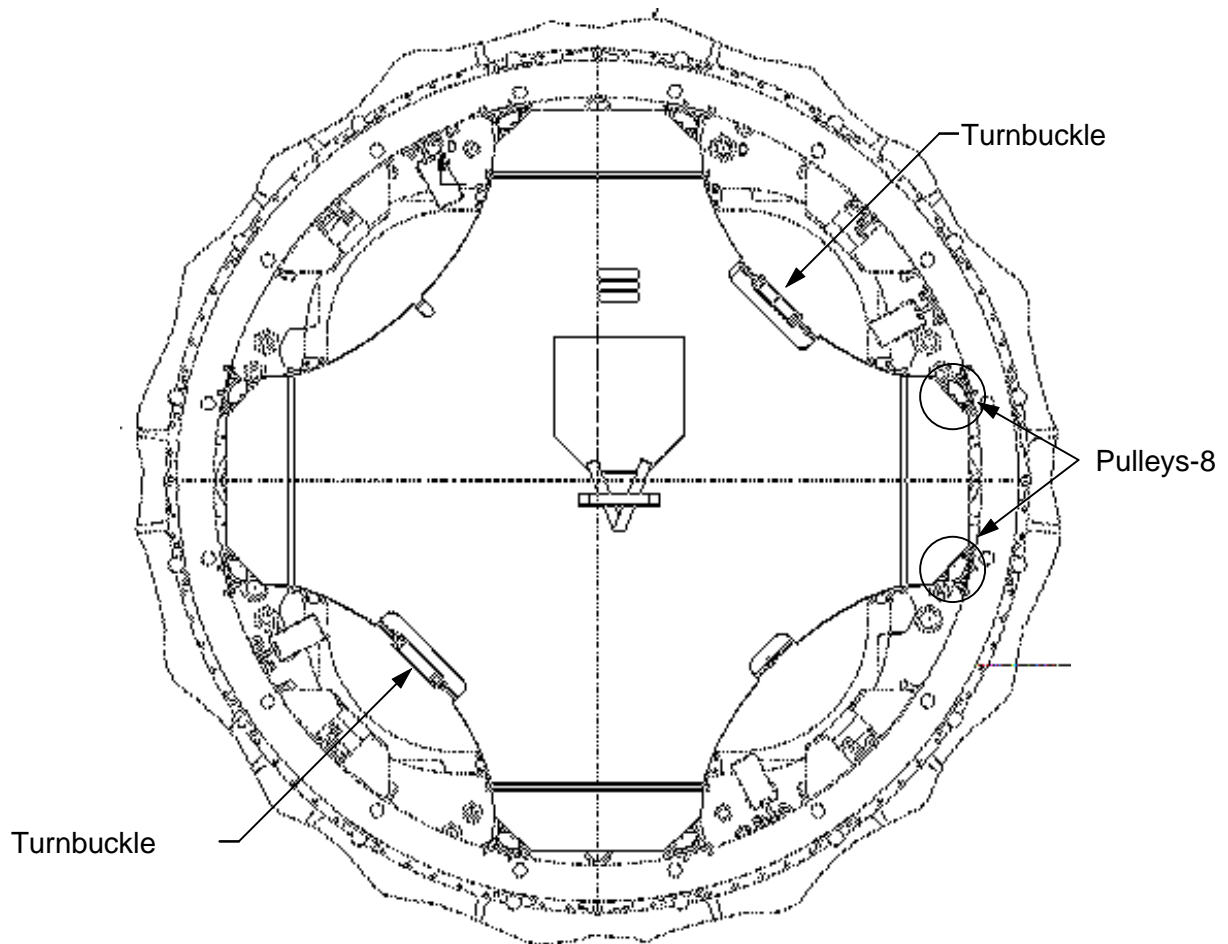
Kit E:

Ratchet 1/4" Drive

### REFERENCED PROCEDURE(S):

None

REMOVE CBM CENTER DISK COVER



View Looking From Passive To Active CBM

Figure 1.- CBM Center Disk Cover.

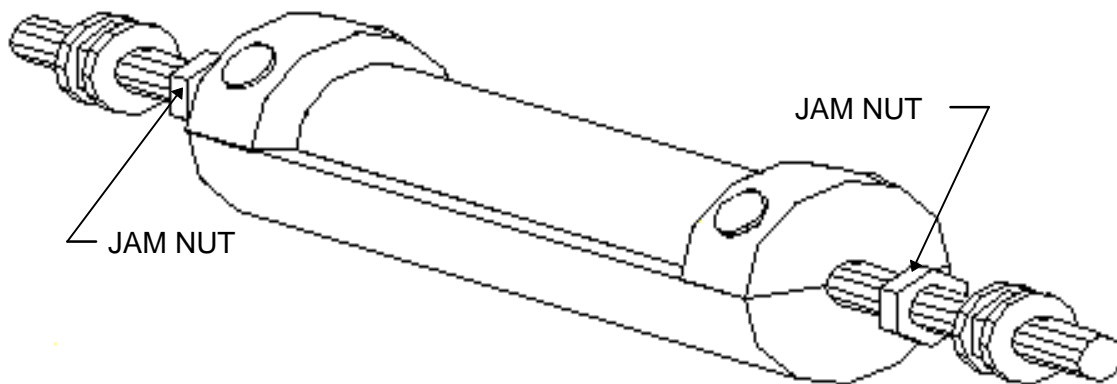
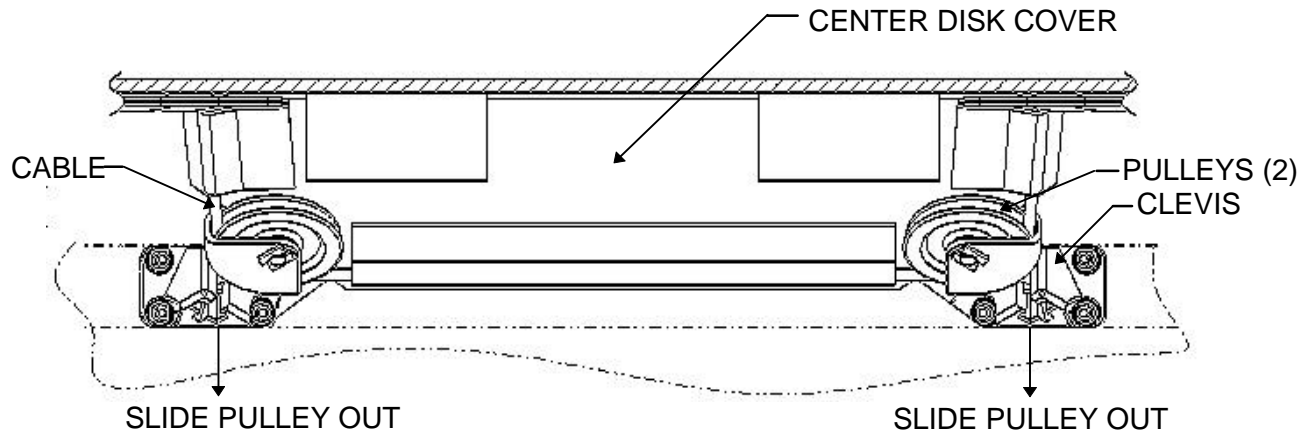


Figure 2.- Turnbuckle.

NOTE

One jam nut on Turnbuckle has left hand threads.  
Cable terminal with holes drilled in it indicates jam nut  
on that side has left hand threads. The cable terminal  
without holes indicates right hand threads.

1. Loosen Jam Nuts (two) at ends of Turnbuckles (1/2" Combination Wrench, 6" Adjustable Wrench).  
See Figures 1 and 2.
2. Unscrew Turnbuckles (two), release tension on pulleys. Approximately 72 turns produces a hard stop.



View Looking From Center Of Center Disk

Figure 3.- Pulley, Cable, and Clevis.

NOTE

Recommend removing pulleys  
and standoff bars by quadrants.

3. Remove pulley from Clevis by pushing towards ACBM ring and sliding from Clevis.  
See Figure 3.

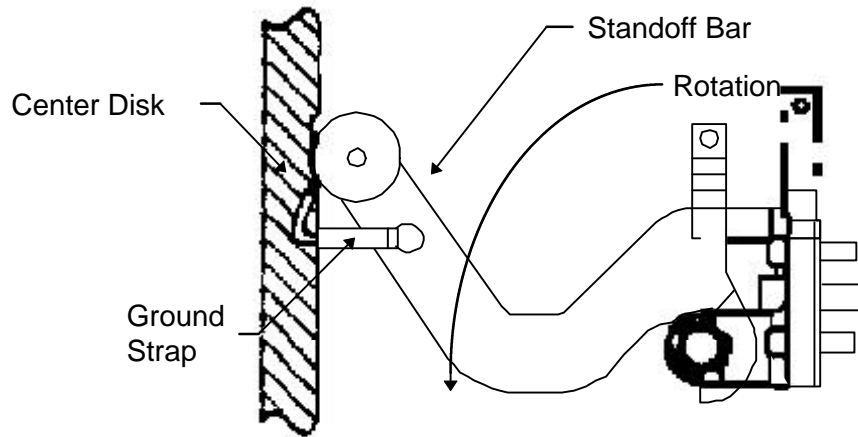


Figure 4.- Side view of Standoff Bar.

4. Remove Ground Strap from Standoff Bar (Ratchet 1/4" Drive, TBD Socket).  
See Figure 4.
5. Rotate Standoff Bar towards hatch center, remove from structure.  
Temporary stow.  
See Figure 4. Repeat steps 3 --- 5 for remaining Standoff Bar Assemblies (three).
6. Fold cover.  
Temporary stow.
7. Stow tools.

## **CBM CENTER DISK COVER REPLACE**

### OBJECTIVE:

Remove CBM Center Disk to allow crew access to attached modules and vestibule areas.

### LOCATION:

Installed: Node 1 Radial Ports

Stowed: √Maintenance Database

### DURATION:

20 minutes

### PARTS:

None

### MATERIALS:

None

### TOOLS REQUIRED:

Equipment Bag

Portable Work Lights

Kit A:

1/2" Combination Wrench

6" Adjustable Wrench

Kit E:

Ratchet 1/4" Drive

### REFERENCED PROCEDURE(S):

None

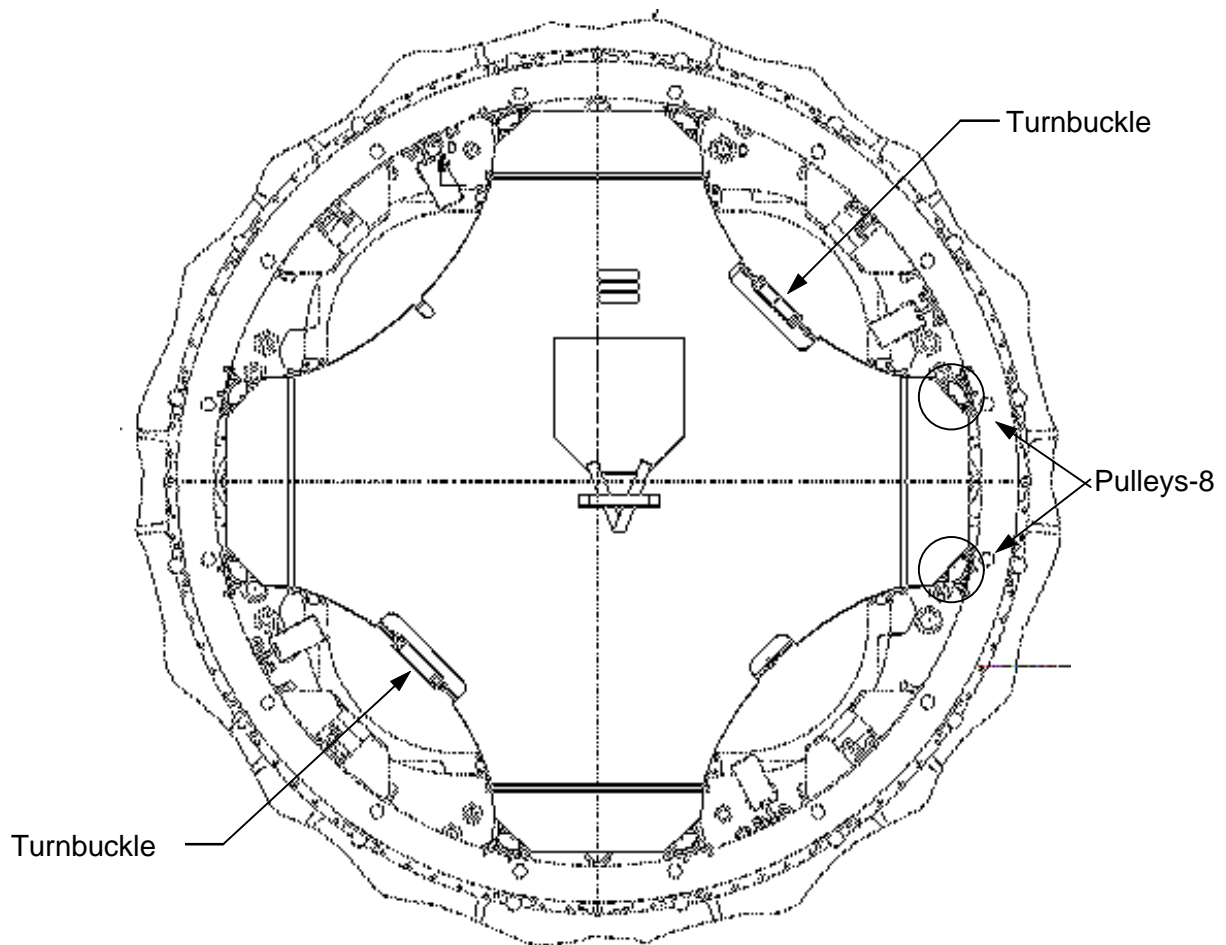


Figure 1.- CBM Center Disk Cover.

REPLACE CBM CENTER DISK COVER

1. Remove cover from stowage. Slide cover in place past the CPA motor controllers before unfolding it for installation.
2. Unfold top flap from center towards controller. See Figure 1.



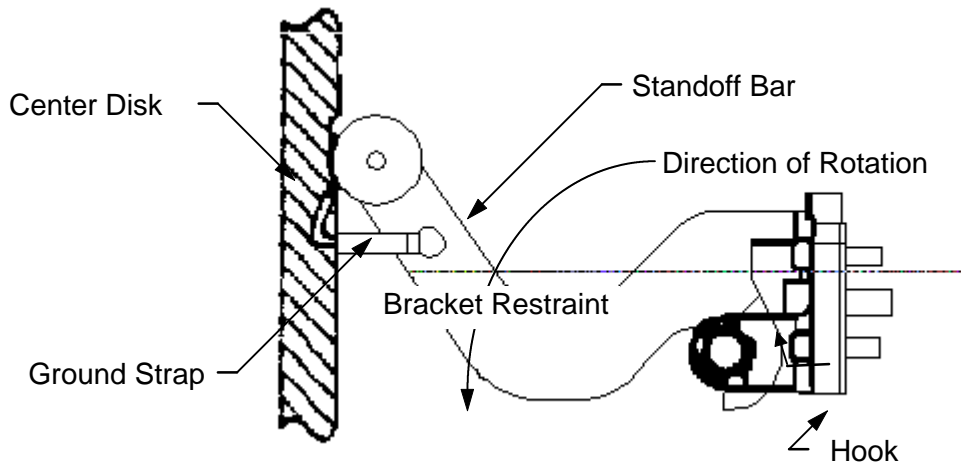
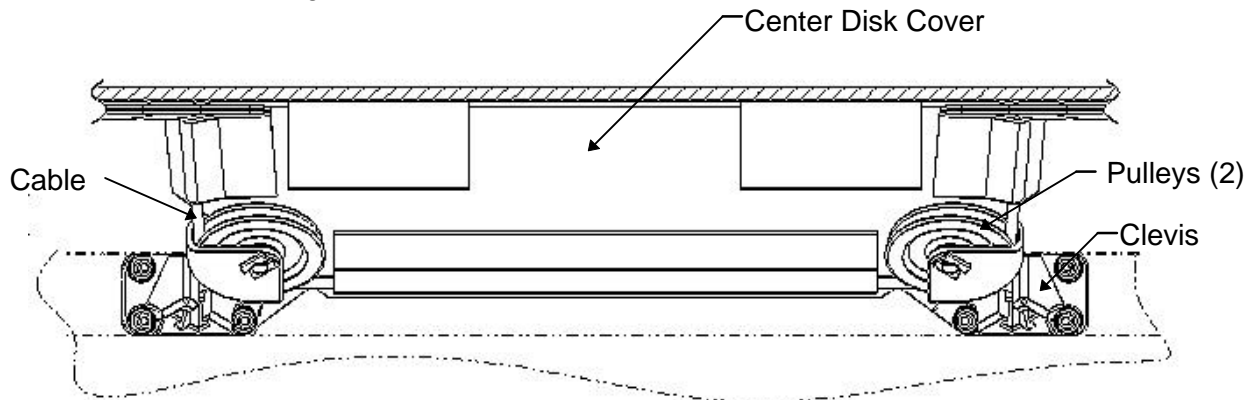


Figure 2.- Side view of Standoff Bar.

3. Place Standoff Bar hooks under bracket restraints.  
See Figure 2.
4. Rotate Standoff Bar approximately 45 degrees away from CPA, assure both hooks rotate evenly into place.  
See Figure 2.



View Looking From Center Of Center Disk

Figure 3.- Pulley, Cable, and Clevis.

5. Insert pulley into bracket until pulley snaps into place. Repeat for additional pulley in quadrant.  
See Figure 5.
6. Repeat steps 3 --- 5 for additional quadrants (three).
7. Restore tension to Center Disk, grasp Turnbuckle, twist until TBD (1/2" Combination Wrench).

8. Tighten Jam Nuts (two) at ends of Turnbuckles (1/2" Combination Wrench, 6" Adjustable Wrench).  
See Figures 2 and 3.
9. Replace Ground Strap on Standoff Bar (Ratchet 1/4" Drive, TBD Socket).  
See Figure 2.
10. Stow tools.

## PMA 3 INGRESS

## TOOLS AND EQUIPMENT REQUIRED

Unstow, place in tool bag:

## APAS Hatch Tool (two)

## Alcohol Pads (for APAS hatch seal)

## Station Portable Fire Extinguisher (CO2 bottle)

IMV Caps (two)

O-rings for IMV Caps (two sets of two)

## Spotlight

Towel

### 4-inch Ratchet Wrench, 1/4" Drive

TBD-inch extension, 1/4" Drive

## 1/4" to 3/8" Adapter, 1/4" Drive

7/16" Deepwell Socket, 1/4" Drive

5/32" Hex Head Driver, 1/4" Drive

### Universal Joint, 3/8" Drive

## 4-inch Adjustable Wrench

General Purpose Tape (2")

## Nylon Wire Tie Wraps

## Tie Wrap Cutting Tool

### Connector Pliers

## Short Flat Tip Screwdriver

## Velcro

Unstow:

## Shuttle/Station Air Duct Assembly

## PMA IMV Duct Extension

## ISS O2 Extension Segments (two)

### FGB Harmful Impurities Cartridge

## Empty 'Return to Houston' Bag

## SETUP EXTERNAL AIRLOCK FOR ODS AND PMA INGRESS

1. Relocate Tool Bag, Shuttle/Station Air Duct Assembly, PMA IMV Duct Extension, and "Return to Houston" Bag to Ext A/L.

A6L  
(A7L)

2.   cb Depress MN A(B) SYS 1(2) Vent → CI  
      cb Depress ESS1BC(2CA) SYS 1(2) Vent ISOL → CI  
      √VEST DEP VLV SYS 1(2) VENT - CI (tb-CI)  
                                ISOL → CI (tb-CI)  
      cb Depress MN A(B) SYS 1(2) Vent → Op  
      cd Depress ESS1BC(2CA) SYS 1(2) Vent ISOL → Op

---

NOTE

Expect possible dP/dt klaxon.

ODS

HATCH

3. EQUAL VLV (one) → Norm  
 $\sqrt{\text{ODS Hatch } \Delta P} \leq 0.2 \text{ psid}$

INGRESS ODS VESTIBULE

4. Open ODS Hatch per decal.  
EQUAL VLV (one) → Off  
Install cap.

**CAUTION**

Surfaces may be below freezing for a short time after initial ODS Hatch opening. Avoid direct contact with vestibule surfaces until SHUTTLE VESTIBULE TEMP 1,2 (two) indicate > 40° F (SM 211 DM STATUS ODS INTERFACE).

Insert ODS air duct extension into vestibule.  
Wipe any condensate from vestibule volume using the Towel.

5. ✓ **MCC-H** "Go for Node 1 Ingress."

OPEN APAS HATCH

APAS  
Hatch

6. APAS EQUAL VLV → Op

SPEC 66 ENVIRONMENT

AFD

7. When CABIN dP/dT < 0.01 (~5 minutes)  
Open APAS Hatch.  
Select 'WORKING' torque setting on APAS Hatch Tool.  
Insert tool in hatch socket.  
Rotate tool 3-4 turns in direction of 'Open' arrow until it clicks.

\*\*\*\*\*  
\* If tool prematurely slips or does not engage: \*  
\* Select 'EMERGENCY' setting on hatch tool. \*  
\* Reattempt to open Hatch. \*  
\*\*\*\*\*

Remove tool.  
Open Hatch.  
Tether tool on hatch handle.  
Secure Hatch in open position using fixing device.

SHUTTLE/STATION AIR DUCT INSTALLATION

A6L  
(A7L)

8. ARLK/TNL FAN A(B) → Off

EXT  
A/L

9. Cut and remove tie-wrap holding air inlet flex duct to halo cross using Tie-Wrap Cutting Tool.  
Disconnect air inlet flex duct from halo cross air duct.  
Obtain Shuttle/Station Air Duct Assembly.  
Remove handled clamp from Shuttle/Station Air Duct Assembly.  
Install handled clamp over end of air inlet flex duct.

10. Insert male end of male/female duct adapter on Shuttle/Station Air Duct Assembly into end of air inlet flex duct.  
Tighten clamp using handle until secure.  
Secure assembly across the adapter using fabric straps/snaps.  
Secure Shuttle/Station Air Duct Assembly with TBD to TBD.
- PMA3 11. Remove band clamp and cap from PMA3 hard duct.  
Stow cap on side of hard duct with pre-positioned Velcro.  
  
Connect free end of Shuttle/Station Air Duct Assembly to PMA3 hard duct inlet with band clamp.  
Secure band clamp with over-center latch.
12. Remove Velcro strap from PMA3 hard duct grille assembly (near duct connection just made).  
Verify grille cover open.
- A6L (A7L) ARLK/TNL FAN A(B) → On  
√Airflow at grille
- PMA3/ Node 1 I/F 13. Remove V-band clamp and flange saver from forward IMV flange.  
Tmpty stow V-band in TBD for use later in this step.  
Stow flange saver in Bag (to be used in PMA1 Ingress).  
  
Disconnect PMA3 Flex duct from launch support.  
Tmpty stow V-band in TBD for use later in this step.
14. Connect PMA3 Flex duct to PMA IMV extension duct with V-band clamp.  
Secure V-band clamp with over-center latch.  
Tighten V-band clamp with Ratchet and Deepwell Socket.
15. Route PMA IMV duct extension around port perimeter of Node 1/PMA3 interface.  
Connect other end of PMA/Node 1 duct extension to Node 1 Aft IMV flange with V-band clamp.  
Secure V-band clamp with over-center latch.  
Tighten V-band clamp with Ratchet and Deepwell Socket.  
  
Secure PMA IMV duct extension around port perimeter of Node 1/PMA3 interface with Velcro straps.
- Node 1 Deck Hatch 16. Remove launch hatch restraint pin.  
Stow pin in "Return to Houston" Bag.
- PMA3 17. Close grille cover on PMA3 hard duct.

## NODE 1 INGRESS

- EPCS      NODE 1 IMV DECK AFT VLV OPENING
- Node 1: ECLSS: FDIR  
Node 1 FDIR Details
1. **cmd** Node 1-1 MDM IMV FDIR Status - Enable **Execute**  
**cmd** Node 1-2 MDM IMV FDIR Status - Enable **Execute**  
√Node 1\_1 MDM IMV FDIR Status - Ena  
√Node 1\_2 MDM IMV FDIR Status - Ena  
  
Node 1: ECLSS: IMV deck aft Vlv  
Node 1 IMV Deck Aft Vlv
  2. sel RPCM N13B B RPC 15  
RPCM N13B B RPC 15  
√Close Cmd - Ena  
  
√**MCC-H**  
  
**cmd** Close **Execute**  
√Position - Cl  
  
'Node 1 IMV Deck Aft Vlv'
  3. **cmd** On **Execute**  
√Enable - On  
**cmd** Open **Execute**  
√Open Indicator - Enabled  
**cmd** Open Confirm **Execute**  
Wait 20 seconds.  
√Status - Op
- PMA3      EQUALIZE WITH NODE 1  
Ovhd
4. Node Deck Hatch MPEV → Open
  5. Wait TBD minutes.
  6. Open Node 1 deck hatch per decal.
  7. Node Deck Hatch MPEV → Close
- ESTABLISH VENTILATION WITH NODE 1  
Node 1: ECLSS: cabin fan  
Node 1 Cabin Fan
- EPCS      14. If State - Off  
PMA3           Perform NODE 1 CABIN FAN ACTIVATION.
15. Close grille cover on PMA3 hard duct.
  16. √Airflow from Node through open hatchway

PROVIDE POWER TO NODE 1 INTERNAL LIGHTS

EPCS 17. Node 1: EPS: RPCM N13B A

**RPCM N13B A**

sel RPCM Details

sel RPC [X] [X] = **5** **13**

√RPC [X] Close Cmd - Ena

√**MCC-H**

**cmd** Close **Execute**

√RPC [X] Position - CI

Repeat

18. Node 1: EPS: RPCM N13B B

**RPCM N13B B**

sel RPC 1

√Close Cmd - Ena

√**MCC-H**

sel Commands

**cmd** Close **Execute**

√Position - CI

19. Node 1: EPS: RPCM N13B C

**RPCM N13B C**

sel RPC 1

√Close Cmd - Ena

√**MCC-H**

sel Commands

**cmd** Close **Execute**

√Position - CI

20. Node 1: EPS: RPCM N14B B

**RPCM N14B B**

sel RPC 1

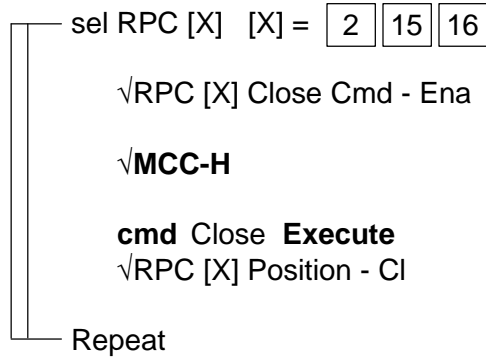
√Close Cmd - Ena

√**MCC-H**

sel Commands  
**cmd Close Execute**  
√Position - CI

21. Node 1: EPS: RPCM N14B C  
RPCM N14B C

sel RPCM Details



NOTE

It may take 30 minutes for cold lights to come up to full bright.  
Lights must come up to full bright before turning them off.

PFE AND QDM INSTALLATION

- Node 1 22. Stow ISS portable fire extinguisher in Node 1 fwd port alcove locker.

NODE 1 PPRV CONFIGURATION

- Node 1 23. Unstow PPRV Caps.

- Node 1 24. Install caps (two) on Node 1 Port, Stbd PPRVs  
Port,  
Stbd  
Hatch

VERIFY AND CONFIGURE NODE 1 INTERIOR LIGHTS

- Node 1 25. √All (eight) Node 1 Interior Lights - Full Bright  
Fwd  
Endcone

- Node 1 26. NOD1OS2-1 Int Light pb → Off  
NOD1OP2-1 Int Light pb → Off  
NOD1OP2-2 Int Light pb → Off



## FGB INGRESS

### TOOLS AND EQUIPMENT REQUIRED:

Spotlight  
General Purpose Tape (2")  
4-inch Adjustable Wrench  
APAS Hatch Tool  
Alcohol Pads (for APAS hatch seal)  
'Return to Houston' Bag  
Two Air Sample Bottles

CRT

**SPEC 66 ENVIRONMENT**

1. When CABIN dP/dT < 0.01 (~15 minutes)

√**MCC-H** 'Go for FGB Ingress'.

2. INGRESS PA

FGB

Per **MCC-H**, open FGB PA APAS Hatch.

APAS  
Hatch

1. Select 'TBD' (WORKING) torque setting on Hatch Tool,
2. Insert tool in hatch socket,
3. Rotate 6-7 turns in direction of 'Î ÒÊÐ' (Open) arrow until it clicks.

```
* ***** *
* If tool prematurely slips or does not engage *
* Select 'ÀÃÀÐÃÊÉÍ Î Â' (EMERGENCY) setting on *
* hatch tool. *
* Reattempt to open Hatch. *
* ***** *
```

4. Verify all latches are opened.
5. Remove tool.
6. Open Hatch.
7. Secure Hatch in open position using fixing device.
8. Inform **MCC-H** of PA Hatch opening complete.

3. INSTALL AIR DUCTING

PMA1-PA  
Hatch

1. Connect FGB rigid air duct and Node 1 rigid air duct.
2. Request **MCC-M** to activate FGB booster fan.

4. ACTIVATE NODE 1 - FGB INTERMODULE VENTILATION

EPCS

Node 1: ECLSS

**NODE 1: ECLSS**

sel Node\_1\_Aft\_Port\_IMV\_Fan

√Close Cmd - Ena  
sel RPC Commands  
**cmd** RPC Position - Close **Execute**  
√RPC Position - Close

NODE 1: Aft Port IMV Fan

sel Fan Commands  
**cmd** On **Execute**  
√Stat - In Trans

NODE 1: Aft Port IMV Fan

Wait 15 seconds.  
√Stat - On  
√Spd, rpm: 7462 --- 9500

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MATED OPERATIONS

TRANSFER PROCEDURES..... TBD

MATED OPS

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ASSEMBLY SUPPORT OPERATIONS

DTO 257A/B SETUP.....	TBD
DTO 257A OPERATIONS.....	TBD
DTO 257B OPERATIONS.....	TBD

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JOINT COMM

C&T EARLY COMM INITIAL ACTIVATION ..... 7-3

JOINT COMM



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## C&T EARLY COMM INITIAL ACTIVATION

INSERT LOCATION DRAWING --TBD

- Orb  
TBD
1. Verify no PCS active on UB-ORB-N1-1(2) bus in Orb AFD.

\*\*\*\*\*  
\* If PCS active on either bus \*  
\* Perform EPCS DEACTIVATION, step 1 (SODF: C&DH), then \*  
\*\*\*\*\*

### POWER ON RF PWR DIST BOX SWITCHES

- Nod1  
xx\_xx
2. Configure switches located on RF PWR DIST BOX ORU.  
PGSC/RF → On  
CTP → On  
XCVR → On  
SBANT → On  
PTANT → On

√SPARE - Off

3. Verify mode switch is in Low Rate position on CTP.  
√MODE SWITCH - LOW RATE CMD/TLM

### POWER ON RF PWR DIST BOX

Orb

SM 203 EARLY COMM

4. N1RS2A RPC 11 - ITEM 15 EXEC (\*)

- Nod1  
xx\_xx
5. Verify power LEDs on RF PWR DIST BOX ORU.  
√XMIT SW PWR - GREEN  
√RCV SW PWR - GREEN

### POWER ON ANTENNA HEATERS

Orb

SM 203 EARLY COMM

6. N1RS1C RPC 6 - ITEM 3 EXEC (\*)  
N1RS1C RPC 13 - ITEM 7 EXEC (\*)

### POWER ON CTP

7. N1RS2A RPC 10 - ITEM 13 EXEC (\*)

- Nod1  
xx\_xx
8. Verify power LED on CTP  
√CTP POWER - GREEN

Orb

SM 203 EARLY COMM

9. √CTP POST - PASS
  - √DECRYPT POST - PASS
  - √SYS MODE - LO (ITEM 21)
  - √PTG MODE - AUTO (ITEM 23)
  - √PORT ANT I/F - ERR
  - √STBD ANT I/F - ERR
  - √PORTCOM I/F - ERR

#### POWER ON TRANSCEIVER

10. N1RS2A RPC 5 - ITEM 9 EXEC (\*)
  - Wait 1 minute.
  - √PORTCOM I/F - OK

- Nod1  
xx\_xx
11. Verify power LEDs on Transceiver.
    - √+5V POWER - GREEN
    - √-5V POWER - GREEN
    - √+12V POWER - GREEN

#### POWER ON ANTENNAS

Orb SM 203 EARLY COMM

12. √XMIT - OFF (ITEM 18)
  - N1RS1C RPC 5 - ITEM 1 EXEC (\*)
  - N1RS1C RPC 12 - ITEM 5 EXEC (\*)
  - √Port Ant Temp ≥ TBD (-50 deg C)
  - √Stbd Ant Temp ≥ TBD (-50 deg C)

#### NOTE

Power to antenna electronics is thermostatically controlled to prevent applying power below operating limits. When antenna I/F telemetry is received, the antenna electronics are receiving power.

- √PORT ANT I/F - OK
- √STBD ANT I/F - OK

#### ESTABLISH LOW RATE COMMUNICATIONS LINK

13. Verify ground and TDRSS network configured for comm.

**MCC-H** to shuttle: "Ready for XMIT ON."

Orb SM 203 EARLY COMM

14. √FRM LOCK PORTCOM - YES
  - √FRM LOCK CTP- YES
  - √SIG STR ≥ TBD
  - XMIT ON - ITEM 17 EXEC (\*)

Shuttle to **MCC-H**: "XMIT ON."

## **MCC-H COMMANDS TO EARLY COMM**

### **NOTE**

Ground commanding through Early Comm link used to command during this portion of procedure to test command capability.

nav Early Comm

Early S-Band Comm Management

'System Configuration'

15. sel Key Sel  
**cmd** Decryption\_Key\_999 **Execute**

√Decryption\_Key - 999

sel Decryption

**cmd** Decryption\_On **Execute**

√Decryption - On

Ground Control configures FEP for encryption with key 999

'Antenna Command Display'

16. sel Port Array  
**cmd** Port\_Array\_Beam\_Select\_13 **Execute**

√Array - Port

√Beam Sel - 13

sel Stbd Array

**cmd** Stbd\_Array\_Beam\_Select\_0 **Execute**

√Array - Stbd

√Beam Sel - 0

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CONTROL HANDOVER

TOC TBD

CONTROL  
HANDOVER

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## EGRESS STATION

ODS VESTIBULE/PMA DEPRESS.....	TBD
NODE 1 EGRESS.....	9-3
ODS VOLUME PREP FOR EGRESS.....	TBD
HATCH COMMON CLOSE.....	TBD
CBM CONTROLLER REINSTALLATION .....	TBD

EGRESS  
STATION



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## NODE 1 EGRESS

### TOOLS AND EQUIPMENT REQUIRED

Flashlight

### MODULE EGRESS

Node1  
Deck  
Hatch

1. √MPEV uncapped

PMA3 2. Open grille cover on PMA3 hard duct.

### NODE 1 IMV DECK AFT VLV CLOSING AND INHIBITING

EPCS 3. Node 1: ECLSS: IMV deck aft Vlv

Node 1 IMV Deck Aft Vlv

**cmd Close Execute**

√Closed Indicator - Enabled

**cmd Close Confirm Execute**

Wait 20 seconds.

√Status - CI

**cmd Off Execute**

√Enable - Off

4. sel RPCM N13B B RPC 15

RPCM N13B B RPC 15

√Open Cmd - Ena

√**MCC-H**

sel Commands

**cmd Open Execute**

√Position - Op

Node 1  
Deck  
Hatch

5. Close Node 1 Deck Hatch per decal.

6. √MPEV - Close

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## MALFUNCTION PROCEDURES

OIU MALFUNCTION.....	TBD
OIU FGB MDM SYNC FAILURE.....	TBD
OIU TO FGB COMM FAILURE.....	TBD
APCU MALFUNCTION.....	TBD
SHUTTLE VHF STANDALONE MALFUNCTION PROCEDURE .....	TBD

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## EMERGENCY RESPONSE

FLIGHT 2R/4A RAPID DEPRESSURIZATION* .....	11-3
FLIGHT 4A TOXIC SPILL .....	TBD
ISS EMERGENCY EGRESS .....	11-9

\*Controlled out of EMERGENCY Book 4A Prelim

EMERGENCY  
RESPONSE

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## FLIGHT 2R/4A RAPID DEPRESSURIZATION

### SPACE SHUTTLE CREW EVACUATION

#### NOTE

Steps 1 and 2, 3 --- 5 should be performed concurrently.

STS  
Crew

1. Evacuate to space shuttle.
2. Go to step 6.

ISS  
Crew

3. Evacuate to service module.
4. When all three ISS crew present  
Silence Depressurization Alarm
5. Go to step 10.

STS    Shuttle  
CM2    ODS

6. DISCONNECT SHUTTLE/ISS UTILITIES  
PMA-3 Air Duct ←|→ ODS Air Duct

STS  
CDR

√All shuttle crew present

STS  
CM2

7. SECURE PMA 3/ODS INTERFACE  
PMA 3 APAS Equal Vlv → Close

Signal ISS, "Ready to Close PMA 3 Hatch."

STS  
CM2

8. ISS LEAK CHECK  
PMA 3 APAS Hatch → Close

Signal ISS, "PMA 3 Hatch closed."

STS  
CDR

√Shuttle cabin pressure

If shuttle cabin pressure not decreasing

Signal ISS, "Station Leak"

PMA 3 APAS Equal Vlv → Open

ODS Hatch → Close

Signal ISS, "ODS Hatch closed. Standing by."

Standby for instructions from ISS Commander.

STS  
CM2

9. PMA 3/ODS VESTIBULE LEAK CHECK  
√ODS Hatch Equal Vlvs (two) - Off, caps installed

Signal ISS, "Ready to close ODS Hatch."

ODS Hatch → Close

Signal ISS, "ODS Hatch closed."



STS  
CDR

√Shuttle cabin pressure

If shuttle cabin pressure decreasing

Space shuttle leak.

Perform SHUTTLE ORBIT POCKET CABIN LEAK procedure.

If shuttle cabin pressure not decreasing

Signal ISS, "PMA/ODS Vestibule leak."

Report status to ISS.

Standby for instructions from ISS Commander.

ISS Service  
CDR Module

10. EVALUATE RESERVE TIME

√Service module reserve time

Report reserve time to all ISS and STS crew.

ISS Soyuz-  
CDR, DM  
CM2,  
CM3

11. SOYUZ LEAK CHECK

Soyuz-OM Fwd Hatch → Close

Soyuz-OM Fwd Hatch Equal Vlv → Close

√Soyuz-OM cabin pressure

If Soyuz-OM cabin pressure decreasing

Soyuz-OM Fwd Hatch Equal Vlv → Open

Soyuz-OM Fwd Hatch → Open

Re-ingress SM

Soyuz-OM Fwd Hatch → Close

SM-PA Deck Hatch → Close

SM-PA Deck Hatch Equal Vlv → Close

Report status to **MCC** and to all crew.

Await instructions from **MCC**.

If Soyuz-OM cabin pressure not decreasing

Soyuz not leaking.

Either ISS or Shuttle leak

Go to step 12.

Soyuz-  
OM

12. RE INGRESS ISS

Soyuz-OM Fwd Hatch Equal Vlv → Open

Soyuz-OM Fwd Hatch → Open

ISS     Service  
Crew    Module

13. IMV ISOLATION

√SM reserve time

If SM reserve time  $\leq$  5 minutes, go to step 20.

**cmd IMV Isolate Node 1    Execute**

√Node 1 Aft Port IMV Vlv Stat - Isolated

√Node 1 Aft Stbd IMV Vlv Stat - Isolated

√Node 1 Fwd Port IMV Vlv Stat - Isolated

√Node 1 Fwd Stbd IMV Vlv Stat - Isolated

√Node 1 Deck Fwd IMV Vlv Stat - Isolated

√Node 1 Deck Aft IMV Vlv Stat - Isolated

Node 1

14. PMA 3 LEAK CHECK

Node 1 Deck Hatch → Close

√Node 1 Deck Hatch Equal Vlv - Close

√SM reserve time

√SM cabin pressure

If SM reserve time  $\leq$  5 minutes, go to step 20.

If SM cabin pressure not decreasing

Leak is in PMA 3.

Go to step 21.

PMA-1

15. NODE 1 LEAK CHECK

Node 1 Aft Hatch → Close

Node 1 Aft Equal Vlv → Close

√SM reserve time

√SM cabin pressure

If SM reserve time  $\leq$  5 minutes, go to step 20.

If SM cabin pressure not decreasing

Leak is in Node 1.

Node 1 Aft Hatch MPEV → Open

Node 1 Aft Hatch → Open

Translate to FGB.

FGB PA Fwd Hatch → Close

√FGB-PA EPV1 - Close  
√FGB-PA EPV2 - Close  
√FGB-PA Vest Ctrl Vlv - Close  
√FGB-PA KBD Vlv - Close

If communication with **MCC** not possible,  
Perform NODE 1 LEAK procedure.  
Go to step 21.

- FGB-PA
16. PMA 1 LEAK CHECK  
FGB-PA Fwd Hatch → Close  
√FGB-PA EPV1 - Close  
√FGB-PA EPV2 - Close  
√FGB-PA Vest Ctrl Vlv - Close  
√FGB-PA KBD Vlv - Close
- √SM reserve time  
√SM cabin pressure
- If SM reserve time  $\leq$  5 minutes, go to step 20.
- If SM cabin pressure not decreasing,  
Leak is in PMA 1.  
Go to step 21.
- SM-PA
17. FGB LEAK CHECK  
FGB-ICC Aft Hatch → Close  
√FGB-ICC Aft Equal Vlvs (two) - Close
- √SM reserve time  
√SM cabin pressure
- If SM reserve time  $\leq$  5 minutes, go to step 20.
- If SM cabin pressure not decreasing  
Leak is in FGB.
- cmd FGB-PA EPV1 Op Execute**  
√FGB-PA Fwd Equal Vlv - Open
- cmd FGB-PA EPV2 Op Execute**  
√FGB-PA Fwd Equal Vlv - Open
- Translate to SM-PA
- cmd FGB-ICC KBD Vlv Op Execute**  
√FGB-ICC KBD Vlv - Open

If communication with **MCC** not possible,  
Perform FGB LEAK procedure.  
Go to step 21.

18. SM/FGB VESTIBULE CHECK  
SM-PA Fwd Hatch → Close  
SM-PA Fwd Equal Vlv → Close

√SM reserve time  
√SM cabin pressure

If SM reserve time ≤ 5 minutes, go to step 20.

If SM cabin pressure not decreasing  
Leak is in SM/FGB Vestibule.  
Go to step 21.

18. PROGRESS LEAK CHECK  
Prog N2 Intro Valves (two) → Close

Prog-M  
  
Service  
Module

Prog Fwd Hatch → Close  
  
Prog Fwd Equal Vlv → Close

√SM reserve time  
√SM cabin pressure

If SM reserve time < 5 minutes, go to step 20.

If SM cabin pressure not decreasing  
Leak is in Progress vehicle.  
If communication with **MCC** not possible,  
Perform PROGRESS LEAK procedure.  
Go to step 21.

19. PROGRESS/SERVICE MODULE VESTIBULE LEAK CHECK  
SM-ICC Aft Hatch → Close

**cmd** SM-ICC Aft Equal Vlv CI **Execute**  
√SM-ICC Aft Equal Vlv - Close

√SM reserve time  
√SM cabin pressure

If SM reserve time < 5 minutes, go to step 20.

If SM cabin pressure not decreasing  
Leak is in Progress/SM vest.  
Go to step 21.

If SM cabin pressure decreasing  
Leak is in service module.  
If communication with **MCC** not possible, perform SM LEAK  
procedure.

20. EVACUATION SEQUENCE

Go to SOYUZ EMERGENCY DEPARTURE procedure.

21. SAFE LEAKING MODULE OR VESTIBULE

Advise **MCC-H** and shuttle crew of status.

Await instructions from **MCC-H**.

## ISS EMERGENCY EGRESS

- ODS Vestibule
- If PMA 3 open
1. Disconnect Station/Shuttle Extension ducting, stow in PMA 3
  2. Close PMA 3 APAS Hatch with APAS hatch tool.
  3. If ISS **FIRE** emergency  
| PMA 3 APAS PEV → Open
  4. If other emergency  
PMA 3 APAS PEV → Close
  5. Close ODS Hatch per decal.
  6. √Equal Vlvs (two) - Off
  7. √Caps installed
  8. Report, "ODS Hatch secured."

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EXPEDITED EGRESS AND UNDOCKING

ISS EXPEDITED EGRESS ..... 12-3

EXPEDITED EGRESS  
& UNDOCKING



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## ISS EXPEDITED EGRESS

- If Node 1 open
- Node 1
1. Node 1 Deck Aft, Fwd vlvs (two) → Close
  2. Egress Node 1
  3. Close Node Deck Hatch per decal.
  4. ✓Node 1 Deck MPEV - Close
- If PMA 3 open
- PMA 3
5. Disconnect Station/Shuttle Extension ducting, stow in PMA 2
  6. Close PMA 2 APAS Hatch with APAS Hatch Tool.
  7. PMA 2 APAS PEV → Open
  8. Close ODS Hatch per decal.
  9. ✓Equal Vlvs (two) - Off
- ODS  
Vestibule
10. ✓Caps installed
  11. Report "ODS Hatch secured."

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REFERENCE DATA

INGRESS DRAWING ..... TBD

REFERENCE

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CUE CARDS

TOC TBD

CUE CARDS

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